

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

- 1 1. (original) An optical module comprising:
2 a carrier on which an optical element is mounted, said carrier being formed of a
3 semiconductor material where a first high-frequency transmission line for transmitting a high-
4 frequency electric signal to the optical element is formed; and
5 a dielectric substrate where a second high-frequency transmission line for
6 supplying a high-frequency electric signal to the first high-frequency transmission line of the
7 carried is formed; wherein:
8 a electrical connection is made between the first high-frequency transmission line
9 and the second high-frequency transmission line by use of a conductor wire;
10 said first high-frequency transmission line is formed of a coplanar waveguide; and
11 said second high-frequency transmission line is formed by coupling a first
12 coplanar waveguide, which is formed on an input side by providing a ground layer under the
13 transmission line across a dielectric, to a second coplanar waveguide formed on an output side
14 with a distance between a signal wiring conductor of the transmission line and the ground layer
15 made longer as compared with the first coplanar waveguide or formed on the output side without
16 providing the ground layer
- 1 2. (original) An optical module according to claim 1, wherein:
2 the carrier and the dielectric substrate are placed on and secured to a base
3 member.
- 1 3. (original) An optical module comprising:
2 a carrier on which an optical element is mounted, said carrier being formed of a
3 semiconductor material where a first high-frequency transmission line fro transmitting a high-
4 frequency electric signal to the optical element is formed; and

5 a dielectric substrate where a second high-frequency transmission line for
6 supplying a high-frequency electric signal to the first high-frequency transmission line of the
7 carrier is formed; wherein:

8 an electrical connection is made between the first high-frequency transmission
9 line and the second high-frequency transmission line by use of a conductor wire and a third high-
10 frequency transmission line;

11 said first high-frequency transmission line and said third high-frequency
12 transmission line are formed of coplanar waveguides; and

13 said second high-frequency transmission line is formed by coupling a first
14 coplanar waveguide, which is formed on an input side by providing a ground layer under the
15 transmission line across a dielectric, to a second coplanar waveguide formed on an output side
16 with a distance between a signal wiring conductor of the transmission line and the ground layer
17 made longer as compared with the first coplanar waveguide or formed on the output side without
18 providing the ground layer.

1 4. (original) An optical module according to claim 3, wherein:
2 said dielectric substrate is formed as a package substrate, and said second high-
3 frequency transmission line is formed on the package substrate.

1 5. (original) An optical module according to claim 1, wherein:
2 in the first coplanar waveguide of the second high-frequency transmission line, an
3 electrical connection is made between the ground layer under the transmission line and the
4 ground wiring conductor of the transmission line by use of via hole.

1 6. (original) An optical module according to claim 3, wherein:
2 in the first coplanar waveguide of the second high-frequency transmission line, an
3 electrical connection is made between the ground layer under the transmission line and the
4 ground wiring conductor of the transmission line by use of a via hole.

1 7. (original) An optical module according to claim 1, wherein:
2 in the second high-frequency transmission line, a conversion line for smoothly
3 changing a transmission mode is provided between the first coplanar waveguide and the second
4 coplanar waveguide.

1 8. (original) An optical module according to claim 3, wherein:
2 in the second high-frequency transmission line, a conversion line for smoothly
3 changing a transmission mode is provided between the first coplanar waveguide and the second
4 coplanar waveguide.

9-13. (canceled)

1 14. (currently amended) An optical module according to claim 1 or 3, 3, 9 or
2 ~~13~~, wherein:
3 a main constituent of a semiconductor material of the carrier is one of Si, GaAs,
4 and InP.

1 15. (currently amended) An optical module according to claim 1 or 3, 3, 9 or
2 ~~13~~ wherein:
3 said optical element is an optical modulator element or a semiconductor laser
4 integrated with an optical modulator.

16. (canceled)

1 17. (currently amended) An optical transmission apparatus comprising:
2 an optical module according to claim 1 or 3, 3, 9, 13, or, 16; and
3 a multiplexing IC that multiplexes an inputted parallel signal and then inputs the
4 multiplexed signal into the optical element of the optical module.

1 18. (new) An optical module comprising:
2 a carrier formed of a semiconductor material, on which an optical element is
3 mounted and a first high-frequency transmission line transmitting a high-frequency electric
4 signal to the optical element is formed, the first high-frequency transmission line is made up of a
5 coplanar strip waveguide configured by a first signal line and a first ground wiring conductor
6 extended along at one side of the first signal line; and
7 a dielectric substrate, on which a second high-frequency transmission line
8 supplying a high-frequency electric signal to the first high-frequency transmission line of the
9 carrier is formed, the second high-frequency transmission line is made up of a coplanar strip
10 waveguide configured by a second signal line, a second ground wiring conductor extended along
11 at one side of the second signal line, and a third ground wiring conductor extended along at
12 another side of the second signal line,
13 wherein:
14 an electrical connection between the first signal line and the second signal
15 line and another electrical connection between the first ground wiring conductor and the
16 second ground wiring conductor are made by use of conductor wires respectively at an
17 output side of the second high-frequency transmission line, and
18 the second high-frequency transmission line has a transmission mode
19 conversion structure at the output side thereof, which is configured by increasing a
20 distance between the second signal line and the third ground wiring conductor toward an
21 end of the second signal line at output side thereof.

1 19. (new) An optical module according to claim 18, wherein:
2 the dielectric substrate has a multilayer structure provided with a ground layer
3 under the second high-frequency transmission line, the second ground wiring conductor and the
4 third ground wiring conductor are electrically connected to the ground layer by via holes formed
5 therein.

1 20. (new) optical module according to claim 19, wherein:
2 the distance between the second signal line and the third ground wiring conductor
3 is changed gradually toward the end of the second signal line at the output side of the second
4 high-frequency transmission line.

1 21. (new) An optical module according to claim 20, wherein:
2 the width of the second signal line and another distance between the second
3 ground wiring conductor and the second signal line are gradually changed at the output side of
4 the second high-frequency transmission line toward the end of the second signal line thereat.

1 22. (new) An optical module according to claim 21, wherein:
2 the second high-frequency transmission line is extended from an input side
3 thereof to the output side thereof, and characteristic impedances of the second high-frequency
4 transmission line at the input side thereof and at the output side thereof are identical to each
5 other.

1 23. (new) An optical module according to claim 18 further comprising a base
2 member to which the carrier is secured, wherein:
3 the first ground wiring conductor is electrically connected to the base member.